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AZ CORP COMMISSION  
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IN THE MATTER OF THE APPLICATION OF  
ARIZONA PUBLIC SERVICE COMPANY FOR  
APPROVAL OF THE COMPANY'S 2011  
DEMAND SIDE MANAGEMENT  
IMPLEMENTATION PLAN.

DOCKET NO. E-01345A-10-0219

**COMMENTS OF WESTERN RESOURCE  
ADVOCATES ON APS' RESIDENTIAL  
CONSERVATION BEHAVIOR PILOT  
PROGRAM**

**I. Introduction**

Western Resource Advocates (WRA) hereby submits comments on Arizona Public Service Company's (APS') residential conservation behavior pilot program, filed on June 1, 2010.

Traditionally, utilities have approached energy efficiency as an economic problem in which consumers make decisions on the basis of economic calculations. As a result, many efficiency programs are designed to lower the costs of energy efficiency through rebates or other incentives. However, there are also social motivations and habits that influence energy decisions.<sup>1</sup> Therefore, utilities are expanding the scope of their efficiency program delivery strategies to incorporate social factors affecting energy-related decisions. For example, use of community-based organizations to deliver energy efficiency programs draws upon people's environmental and social motivations for taking action, the organization's social networks, the organization's credibility within the community, and people's interest in community improvement. Shade tree programs are often implemented by community organizations.

APS' proposed conservation behavior program focuses on social norms regarding energy decisions. Under the proposed program, consumers are informed about how their electricity usage compares to electricity usage of similar residential consumers. This kind of peer comparison results in reduced energy usage, in the aggregate, as consumers tend to react if they are informed that their neighbors are using less energy.

<sup>1</sup> Kevin Maréchal, "An Evolutionary Perspective on the Economics of Energy Consumption: The Crucial Role of Habits," *Journal of Economic Issues* 43 (2009): 69-88. Paul C. Stern, "Changing Behavior in Households and Communities: What Have We Learned?" in National Research Council, *New Tools for Environmental Protection: Information, Education, and Voluntary Measures* (Washington, DC, National Academies Press, 2002), pp. 201-211. Corinna Fischer, "Influencing Electricity Consumption via Consumer Feedback: A Review of Experience," TIPS Discussion Paper 8, 2007, [http://www.tips-project.org/download/TIPS\\_DP8\\_Fischer.pdf](http://www.tips-project.org/download/TIPS_DP8_Fischer.pdf).

## II. Study Design

Typically, peer comparison studies obtain data on a participant group of customers and on a control group. The participant group receives energy use information and the control group does not. Then patterns of energy use can be compared between the participant group and the control group to infer the level of energy savings attributable to the “treatment” provided to the participant group. Participants may be subdivided based on customer characteristics or experimental variables (such as the format and frequency of the energy use information provided to participants). APS proposes to involve 80,000 participants, which is large enough to subdivide participants into several segments, and proposes to provide participants with recommendations on how to save energy.

## III. Expected Energy Savings

APS concluded that its proposed program is cost effective based on an expected level of energy savings and on the program’s costs. A key factor in assessing cost effectiveness is expected energy savings. Expected savings levels may be estimated based on experience with similar programs. Peer comparisons similar to APS’ proposed program have been undertaken by the Sacramento Municipal Utility District (SMUD) and Puget Sound Energy (PSE) and have been reviewed by outside evaluators.<sup>2</sup> These evaluations also took into account other factors which might affect energy use such as house size or differences in weather over time. Table 1 summarizes findings from these studies.

APS estimated annual savings of 318 kWh per residential customer (including line losses). This would be about 2.2% of average residential customer use,<sup>3</sup> consistent with SMUD’s savings.

It is unknown whether energy savings from peer comparison are primarily due to behavioral changes, or use of more efficient equipment (such as CFLs), or both. WRA recommends that APS’ evaluation study for this program seek to determine how participants reduced energy usage (e.g., behavioral changes such as turning out lights or adjusting temperature settings, installation of CFLs, etc.), especially since APS will provide recommendations on saving energy.

Although significant savings for peer comparison programs have been found for the aggregate of participants, the results in Table 1 for the PSE study indicate the potential presence of a “boomerang effect” in which customers who initially had a low level of energy usage increased their usage when informed that their usage was below average. One way to overcome the

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<sup>2</sup> Ian Ayres, Sophie Raseman, and Alice Shih, “Evidence from Two Large Field Experiments that Peer Comparison Feedback Can Reduce Residential Energy Usage,” Yale Law School, 2009. Summit Blue Consulting, *Impact Evaluation of OPower SMUD Pilot Study*, September 24, 2009.

<sup>3</sup> Assumes 8% line losses and 13,435 kWh per residential customer (Pinnacle West Capital Corporation, 2009 *Statistical Report*, p. 24).

boomerang effect is by adding to the usage information a message communicating approval of low energy use and disapproval of high energy use. This message can simply be a smiley face or frowning face.<sup>4</sup> APS notes that it will maximize the potential for energy savings by analyzing its customer base to determine which customer segments will be most likely to yield the highest energy savings. APS expects that pilot program participants will be largely comprised of higher than average usage customers.<sup>5</sup> WRA recommends that APS evaluate its pilot program for the presence of a boomerang effect and, if this effect is significant, develop modifications of the program, going forward, to reduce its impact. For example, APS could focus its program on high energy users.

**Table 1. Summary of Findings from SMUD and PSE Studies**

Study	Program	Number of participants*	kWh savings	Other effects noted	Duration of impact
Ayres et al.	SMUD	35,000	2.1%	<ul style="list-style-type: none"> <li>• Largest percentage savings occur in houses with lowest values</li> <li>• Largest % savings occur in houses with highest pre-program kWh per square foot</li> </ul>	Savings persist for at least one year after start of program (the entire time period covered by the data)
Summit Blue	SMUD	35,000	2.1% to 2.2% in first year of program	<ul style="list-style-type: none"> <li>• Largest percentage savings in summer</li> <li>• Houses with pools saved more kWh than houses without pools</li> </ul>	Summer savings persisted into a second year; second year summer savings were higher than in the first year
Ayres et al.	PSE	35,000-40,000 (sample size reported differently within study)	1.2%	<ul style="list-style-type: none"> <li>• Largest % savings occur on Sundays</li> <li>• Largest % savings occur in houses with lowest values</li> <li>• Largest % savings occur in houses with highest pre-program energy use per square foot</li> <li>• kWh use increased for houses with lowest pre-program energy use</li> </ul>	Savings persist for at least several months after start of program (the entire time period covered by the data)

\* Number of customers assigned to treatment group, excluding customers in the control group.

#### IV. Recommendation

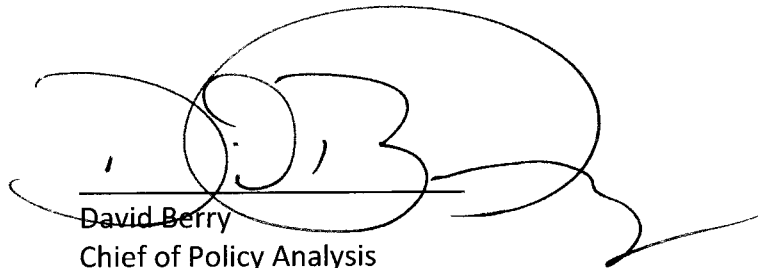
The proposed program goes beyond what can be accomplished through financial incentives alone and is likely to increase energy efficiency through behavioral changes and possibly

<sup>4</sup> P. Wesley Schultz, Jessica M. Nolan, Robert B. Cialdini, Noah J. Goldstein, and Vidas Griskevicius, "The Constructive, Destructive, and Reconstructive Power of Social Norms, *Psychological Science*, vol. 18 (2007): 429-434.

<sup>5</sup> See pages 2 and 3 of Attachment 2 of APS' June 1, 2010 filing in this docket.

through adoption of more efficient devices. WRA recommends that the Commission approve APS' residential conservation behavior pilot program. WRA also recommends that the evaluation study be designed to infer how participants reduced energy usage and recommends that the evaluation study look for the existence of a boomerang effect. If a boomerang effect is found, APS should modify the program, going forward, to reduce the impact of the effect.

Respectfully submitted this 2<sup>nd</sup> day of September, 2010 by

A large, stylized handwritten signature in black ink, appearing to read 'DB', is written over a horizontal line.

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